IET, Dr. Shakuntala Misra National Rehabilitation University, Lucknow,
Department of Electrical Engg.
Sessional Test – 1

Sem & Year: 4th & 2nd **Session: 2023-24**
Subject: electrical machines **Code: TEE 401**
Duration: 90 Minutes **Max. Marks: 20**

Part A

Attempt all questions **(1×4=4 Marks)**

1. No of parallel path in wave winding
   a. 2
   b. 4
   c. 6
   d. P (no of a pole)

2. Torque in motor is proportional to
   a. Flux
   b. Current
   c. Both A & B
   d. NONE

3. Brush of DC machine made of
   a. Carbon
   b. Copper
   c. Aluminum
   d. Iron

4. In Transformer having fixed value
   a. F
   b. V
   c. I
   d. All

Part B

Attempt any two Questions **(2×3=6 Marks)**

1. **Drive EMF equation of DC generator.**

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2. Drive EMF equation of transformer. And draw circuit diagram.
3. A DC machine is connected to 2 20 V supply mains armature resistance is 0.5 ohm the EMF generated to feed 100 amp to supply is .....

Part C

Attempt any two Questions (2×5=10 Marks

1. With the help of the circuit diagram explain the OC & SC test in the transformer
2. Draw and explain torque vs current characteristics of the DC shunt and series motor.
3. A-220V, 20A DC machine has an armchair resistance of 0.5 A find the induced emf when the machine at as generator at rated load.....?

SEMESTER EXAMINATION MAY-2024

Course Name: - BTech **Semester:- 4th**

Paper Name: - Electrical Machine- 1 **Paper Code:- TEE-401**

Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer. **Max Marks-70**

समय– 3 घण्टे + 20 मिनट प्रति घंटे अतिरिक्त–दृष्टिबाधित एवं सह लेखक परीक्षार्थियों के लिए। अधिकतम अंक–70

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries **3 mark. All questions are compulsory.**
- Section B- Answer any **5 out of 7** given questions in maximum one hundred fifty (150) words. Each question carries **7 marks.**
- Section C- Answer any **2 out of 3** given questions in maximum three hundred (300) words. Each question carries **10 marks.**

निर्देश:

- प्रश्न पत्र में तीन खण्ड अ, ब, व स हैं। सभी खण्ड अनिवार्य हैं।
- खण्ड–अ में प्रत्येक प्रश्न तीन अंक का है। **सभी प्रश्न अनिवार्य हैं।**
- खण्ड–ब में **सात प्रश्नों में से किन्हीं पाँच** प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें। प्रत्येक प्रश्न **सात अंक** का है।
- खण्ड–स में **तीन प्रश्नों में से किन्हीं दो** प्रश्नों के उत्तर अधिकतम (250-300) शब्दों में दें। प्रत्येक प्रश्न **10 अंक** का है।

Section – A (खण्ड–अ)

Objective Questions(वस्तुनिष्ठ प्रश्न)

1. Answer all the following questions. **5x3 =15**

निम्नलिखित सभी प्रश्न अनिवार्य हैं।

i) Minimum air gap is in which type of machine

a) DC Machine
b) Synchronous machine
c) Induction machine
d) all have equal air gap

ii) Which of the following are the variable losses in a rotating machine?

a) core loss and mechanical loss
b) core loss and stray load loss
c) copper loss and core loss
d) copper loss and stray load loss

iii) The principle of dynamically induced emf is utilized in

a) Transformer
b) choke
c) Generator
d) Thermocouple

iv) Which of the following is not a part of dc machine?

a). Armature
b). Commutator
c). field winding
d). Damper winding

v) **Transformer works on _____ principle.**

a) Gauss's law
b) Fleming 's right-hand rule
c) Faraday's law of electromagnectic induction
d) Both (a) and (c)

Section – B (खण्ड–ब)
Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any five of the following questions in maximum 150 words. **5x7=35**
निम्नलिखित में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें।

i. Draw and explain the characteristics of DC series and DC Shunt Motors
ii. What do you mean by starter & its importance in DC motor?
iii. Find the torque exerted by a 4-pole series motor whose armature has 1200 conductors Connected up in wave winding. The motor current is 10A and the flux per pole is 0.02Wb.
iv. Explain the workings of DC generator with the help of a diagram.
v. Draw and Explain the equivalent circuit of the Transformer.
vi. Explain working principle & Derive Torque equation of DC motor.
vii. Derive emf equation of the Dc series generator with diagram.

Section – C (खण्ड–स)
Descriptive Questions (विवरणात्मक प्रश्न)

3. Answer any two of the following question in maximum 300 words. **2x10=20**
निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 300 शब्दों में दें।

i) With relevant phasor diagrams, explain the operation of a practical single-phase transformer under no load condition.

ii) Write short notes on practical & ideal Transformer with diagrams.

iii) An 8-pole lap-connected armature has 960 conductors, a flux of 40 m Wb per pole and a speed of 400 r.p.m. Calculate the emf generated on open circuit. If the armature were wave connected, at what speed it must be driven to generate 400 V.

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